Name: ____ Date: ____________________

Polynomial Factoring solution (version 671)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 108}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-72}}{2}$$

$$x = \frac{6 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{6 \pm 6\sqrt{2}\, i}{2}$$

$$x = 3 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 7i$ and $-8 - 9i$ in standard form $(a + bi)$.**

Solution

$$(-2 - 7i) \cdot (-8 - 9i)$$

$$16 + 18i + 56i + 63i^2$$

$$16 + 18i + 56i - 63$$

$$16 - 63 + 18i + 56i$$

$$-47 + 74i$$

Polynomial Factoring solution (version 671)

3. **Write function $f(x) = x^3 - 3x^2 - 16x - 12$ in factored form. I'll give you a hint: one factor is $(x+1)$.**

Solution

$$\begin{array}{r|rrrr} & 1 & -3 & -16 & -12 \\ -1 & & -1 & 4 & 12 \\ \hline & 1 & -4 & -12 & 0 \end{array}$$

$$f(x) = (x+1)(x^2 - 4x - 12)$$

$$f(x) = (x+1)(x+2)(x-6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8) \cdot (x+4) \cdot (x+1)^2$$

Sketch a graph of polynomial $y = p(x)$.